Human Exploration and Development of Space—Chart 3

Agency Near-Term Goals	HEDS Near-Term Goals	Objectives	Performance Targets
Use the environment of space to expand scientific knowledge	• Explore the role of gravity in physical, chemical, and biological processes	• Enable the research community to use gravity as an experimental variable	• Publish at least 90 percent HEDS sponsored research data; make it accessible on the Internet. • Expand the number of sponsored investigations to 795. • Establish an integrated NASA-wide program in evolutionary biology led by the National Center for Evolutionary Biology. • Demonstrate and utilize for the first time state-of-the-art techniques on Neurolab to understand the function of the nervous system. • Compare responses of at least three different biological models to understand the influence of gravity on the nervous system. • Define the time course of adaptations in the balance system to altered gravitational environments. • Analyze data from Mir to achieve: – a one crew year “jump-start” for ISS biomedical and countermeasures research. – a one crew year “jump-start” for ISS fundamental biology and regenerative life support research. – a three crew year “jump-start” for cell culture and protein crystal growth research. • Analyze radiation research data from Mir and incorporate findings into planning for EVA activities on ISS to minimize crew exposure. • Improve our predictive capabilities of soot processes by at least 50 percent through the analysis of MSL-1 data. • Use the MSL-1 results to eliminate one of three primary fluid flow regimes from consideration by casting engineers. • Use the data obtained by fluid physics experiments on suspensions of colloidal particles on MSL-1 to answer fundamental questions in condensed matter physics.
Enable humans to conduct unique *in-situ* research and development for scientific, engineering, and commercial applications	Continue to open and develop the space frontier: • Develop and assemble the International Space Station and utilize it to advance scientific, exploration, engineering, and commercial activities • Provide safe and affordable human access to space	• Improve Space Shuttle program operations by safely flying the manifest and aggressively pursuing a systems upgrade program • Deploy and operate the ISS for research, engineering, and exploration activities • Ensure the health, safety, and performance of space flight crews	• Achieve seven or fewer flight anomalies per mission. • Achieve 85 percent on-time, successful launches. • Achieve a 13-month flight manifest preparation time. • Achieve a 60 percent increase in predicted reliability of the Space Shuttle. • Deploy the Service Module, and the U.S. Laboratory Module; establish a three-person human presence; and establish initial ISS research capability. • Complete integration for the first EXPRESS rack with five payloads ready for launch at the beginning of fiscal year 2000. • Complete preparations for the launch of the first rack of the Human Research Facility and the Window Observational Research Facility on the first utilization flight. • Complete the development of countermeasure research protocols, and begin testing a minimum of three countermeasures intended to protect bone, muscle, and physical work capacity.

Human Exploration and Development of Space—Chart 3 (continued)

Agency Near-Term Goals	HEDS Near-Term Goals	Objectives	Performance Targets
Advance human exploration of space by successfully conducting robotic missions	Prepare to conduct human missions of exploration	• In partnership with the Space Science Enterprise, carry out an integrated program of robotic exploration of the solar system to characterize the potential for human exploration and development	• Initiate a collaborative program to design and develop radiation and soil/dust measuring devices. • Plan for demonstration of *in-situ* propellant production.
		• Explore and invest in enabling cross-cutting technology and studies that can affordably open up the frontiers for human space exploration where there is a compelling rationale for human involvement	• Evaluate options and define exploration technology investment plan. • Demonstrate advanced technologies, including a biological water processor and a new electronic sensor on a chip capable of real-time continuous toxicological measurements.
Stimulate the application of NASA knowledge and technology in the private sector and promote the commercial use of space	Aggressively seek investment from the private sector: • Increase the affordability of space operations through privatization and commercialization • Share HEDS knowledge, technologies, and assets that promise to enhance the quality of life on Earth	• Promote investments in commercial assets as pathfinders in ISS commercial operations and reduce the cost of Space Shuttle operations through privatization, eventual commercialization, and flying payloads	• Complete development of a commercialization plan for the ISS and Space Shuttle in partnership with the research and commercial investment communities. • Attract $250M in private capital to establish an improved logistics and research capability for the Space Shuttle.
		• Reduce space communications and operations costs through privatization and eventual commercialization	• Reduce space communications operations costs by 30 to 35 percent through a consolidated space communications contract. • Develop options and recommendations to commercialize space communications through a Federal Government corporation.
		• Foster consortia of industry, academia, and government; leverage funding, resources, and expertise to identify and develop commercial space opportunities	• Increase industry investment in space research to $50M in FY99. • Establish two new Commercial Space Centers: one for food technology and one for environmental systems.
		• Involve our Nation's citizens in the adventure of exploring space and transfer knowledge and technologies to enhance the quality of life on Earth	• Initiate a curriculum development program in partnership with ITEA for gravity-related educational modules. • Expand the microgravity research program World Wide Web-based digital image archive established in 1998 by 50 percent. • Conduct two "Telemedicine Instrumentation Pack" demonstrations. • Demonstrate the application of laser light scattering technology for early detection of eye-tissue damage from diabetes.